# 90.9 Series Nitrogen Gas Spring Repair Instructions

## I. Exhausting Pressure

*Self-Contained Mode*

1. When exhausting pressure, position gas spring horizontally with port up for safety.

2. Remove Port Plug *(90.607.110 or 90.505.110)*. Retain parts for use during reassembly.

**CAUTION:** Always wear safety goggles when performing maintenance work.

3. Keeping face and hands clear of port, use Valve Bleed Tool *(90.360.4)* or Port Servicing Tool *(90.320.8)* to depress Compact Valve *(90.260)*. Cover port with a cloth to absorb discharge.

*Linked Mode*

4. After all gas pressure is exhausted, be sure piston rod will freely extend and retract into tube manually. If not, try depressing valve again. If still unsuccessful, **STOP** and contact DADCO.

1. Exhaust nitrogen gas by opening bleed valve on control panel.

2. Verify all pressure is relieved by manually retracting piston rod into tube. If rod will not fully retract, release remaining pressure. If still unsuccessful, **STOP** and contact DADCO.

3. Unthread service fitting and wipe with a clean cloth. Proceed to "II. Port Maintenance" *Linked Mode,* step 1.

## II. Port Maintenance

*Self-Contained Mode*

1. The compact valve usually does not need replacing. If it appears damaged, is leaking or sticking proceed to step 2, otherwise leave the valve undisturbed and proceed to "III. C-Ring Removal."

2. Remove Compact Valve *(90.260)* by unscrewing it with the Port Servicing Tool *(90.320.8).*

3. Replace damaged Compact Valve. Use Port Servicing Tool *(90.320.8)* to thread new Compact Valve *(90.260)* into the port until it fits snugly on the seat. Avoid over torquing the valve.

*Linked Mode*

1. Check port for deposits or burrs and clean thoroughly. Inspect service fitting and replace if it shows signs of damage. Lubricate threads and seals on fitting and thread into the gas spring port.

## III. C-Ring Removal

1. Stand the gas spring upright. Make sure rod is retracted in tube. Place removal sleeve *(90.340.x)* over rod. Tap sleeve until Dust Cover *(90.246.9.x)* is loosened. Remove Dust Cover and discard.

2. Reposition Removal Sleeve and continue tapping until rod cartridge assembly is slightly below retaining ring groove. *DO NOT force the cartridge down further into the Tube Assembly.*

3. Remove C-style Retaining Ring *(90.285.x)* using C-Ring Removal Tool *(90.356)*. Position hooked end of tool below c-ring. For best results locate tool near either end of c-ring.

4. Once hooked end of tool is firmly seated below c-ring, begin pushing it toward outside of gas spring can. The handles will close naturally and c-ring will be extracted as you complete this motion.

## IV. Rod & Cartridge Removal

1. To remove Rod and Cartridge Assembly thread a T-Handle *(90.320.2)* into rod end. Pull entire assembly out of tube. The spring body can be held in a vise (with soft jaws) while pulling out the assembly.

2. Once cartridge and rod are removed from Tube Assembly, slide cartridge off of rod and discard. Retain rod for inspection and reuse.

## V. Cleaning & Inspection

1. Lightly polish rod surface with emery cloth (600 grit). Inspect finish of rod for scratches or gouges. If rod is damaged, it must be replaced.

2. Inspect Tube Assembly for damage, especially around opening. Lightly polish scratches at mouth of Tube Assembly to avoid damaging seals during reassembly. If damage to Tube Assembly is severe, it must be replaced. Wash, clean and dry the inside thoroughly.

**CAUTION:** Before starting reassembly process, be sure repair area is clean. It is imperative that the gas spring be free of all contaminants upon reassembly. If this precaution is not taken, it may lead to premature gas spring failure.

## VI. Cartridge Replacement & Reassembly

1. Choose appropriate repair kit *(90.109.x)* for specific model you are repairing. The repair kit number is laser marked on back of the Tube Assembly. ***NOTE:*** *Repair kits are not interchangeable among models.*

2. Position the Cartridge Assembly over the rod, making sure wiper end marked "TOP" is facing up. While holding cartridge vertically, slide it down the rod to the rod retainer. Be careful not to force cartridge at an angle as seal could become damaged.

3. Lubricate the inside wall of the tube with entire contents of the bottle of assembly oil.

## VI. Cartridge Replacement & Reassembly *(continued)*

4. Place rod and cartridge assembly into the tube. To release any back pressure, depress compact valve. Position top of cartridge just below retaining ring groove. *DO NOT force the cartridge down further into the tube.*

5. Insert C-Style Retaining Ring *(90.285.x)* into retaining ring groove using C-Ring Installation Tool *(90.352)* or standard bench tools. Be sure C-Style Retaining Ring is fully seated in retaining ring groove.

6. Thread T-Handle *(90.320.2)* into end of piston rod. Pull up on T-Handle until top of cartridge is completely past c-ring. The rod must seat cartridge assembly fully before charging. The housing should be flush with end of cylinder. Make sure rod is extended to its proper stroke length. (Depress the compact valve to facilitate full rod extension.)

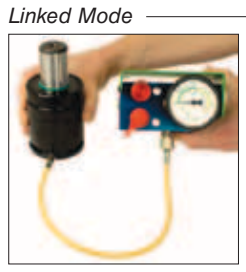
## VII. Charging

**NOTE:** For best results, use the DADCO Charging Assembly which has a shut off valve and Quick Disconnect Adapter at the end of the hose.

*Self-Contained Mode*

1S. Thread the Quick Disconnect Filler Valve *(90.310.143 or 90.310.111)* into port of gas spring. Connect female end of charging assembly to charging nipple. The DADCO Pressure Analyzer *(90.315.5)* can also be used for charging, discharging and gauging pressure.

*Linked Mode*

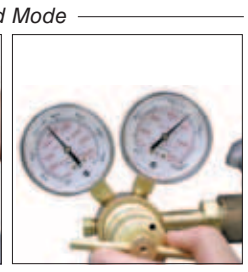


1L. Pipe all gas springs back to the control panel, making sure that all connections are tight and that gas spring rods are extended.

2L. Attach the Charging Assembly *(90.310.040 or 90.310.045)* to the quick disconnect filler valve on the control panel.

*Self-Contained or Linked Mode*

3. Open main valve on nitrogen tank.



4. Set desired charging pressure on regulator.

## VII. Charging *(continued)*

*Self-Contained or Linked Mode*

5. Slowly open shut-off valve and allow gas spring to reach the desired charging pressure. After spring has been charged to desired pressure, CLOSE HOSE SHUT-OFF VALVE AND TANK SHUT-OFF VALVE.

6. Disconnect charging assembly from charging nipple. The small amount of nitrogen trapped between shut-off valve and filler valve will bleed off as you disconnect fitting.

7. Check for leaks at top of tube around rod and at base around valve compartment by using vegetable oil or water.

*Self-Contained Mode*

8S. Verify pressure with a DADCO Load Cell using a Portable Test Stand *(90.305.3)* or arbor press.

9S. Make sure Compact Valve *(90.260)* is in place and thread Port Plug *(90.607.110 or 90.505.110)* securely over top.

*Self-Contained or Linked*

10. Install new Dust Cover *(90.246.9.x).* Tap with a soft mallet until top of Dust Cover rests flush with top of can. The rod wiper should be visible.

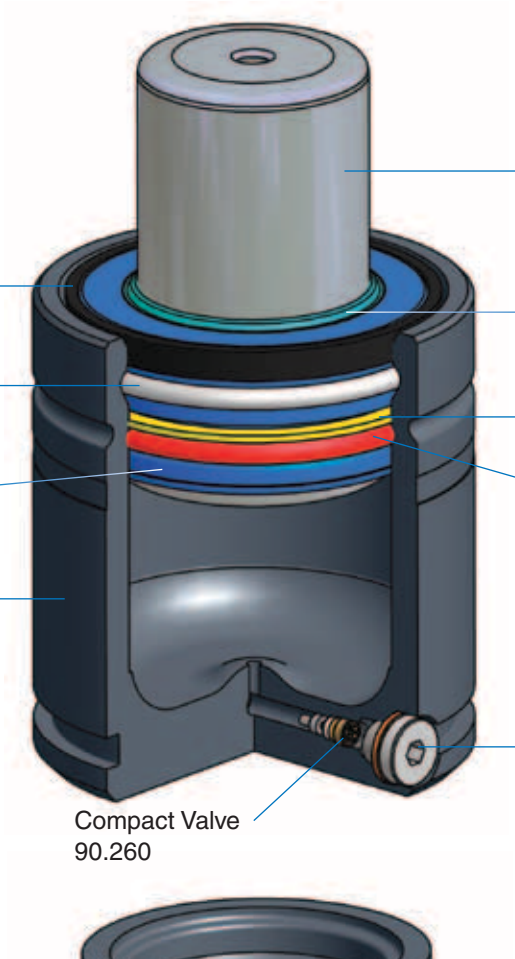
## VIII. Adjusting Gas Spring Pressure

1. To increase spring pressure, thread Quick Disconnect Filler Valve *(90.310.143 or 90.310.111)* into port, set regulator to desired pressure and fill. DADCO's pressure analyzer *(90.315.5)* may also be used to adjust pressure.

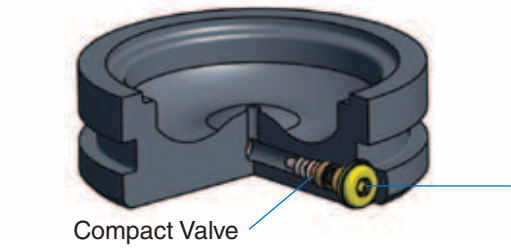
2. To decrease gas spring pressure, depress valve stem using a Valve Bleed Tool *(90.360.4)*.

## 90.9 Series Parts List

### 90.9.03000 – 90.9.07500




### 90.9.01500




**Replacement Part Ordering Example:**

**Models:** 01500, 03000, 05000, 07500

**Piston Rod:** 90.215. 9. *01500.* *025*

Part Number — Stroke (mm)

Series — Model

***NOTE:*** *DADCO's 90.9 Series Nitrogen Gas Springs are permanently marked with model number, serial number and repair kit number. Please refer to these when ordering replacement parts.*

**The 90.9 Series Repair Kit includes:**

Cartridge Assembly..90.230.9.____ Model
***Included in Cartridge Assembly.*

Dust Cover.....90.246.9.____ Model

Assembly Oil.....90.289.1

A step-by-step maintenance manual is also included.

## Repair Tools

**C-Ring Installation Tool • 90.352**

To insert the C-style retaining ring into the retaining ring groove.

**Valve Bleed Tool • 90.360.4**

Use the DADCO Valve Bleed Tool to slowly discharge a spring to the desired pressure.

**Standard Load Cell • 90.300.____**
(01500, 03000, 05000, 07500)

When used with a Portable Test Stand, the Standard Load Cell gives precise measurement of gas spring charging pressure. Request bulletin # 97B119G.

**Quick Disconnect Charging Nipple**
**90.310.143 (M6: Model 01500)**
**90.310.111 (G 1/8: Models 03000 – 07500)**

Use the DADCO Quick Disconnect Charging Nipple to charge 90.9 Series Gas Springs.

**90.310.143** **90.310.111**

**Charging Assembly • 90.310.040**

Use the DADCO Quick Disconnect Charging Assembly with the charging nipple or pressure analyzer to charge self-contained gas springs. It can also be used with a DADCO control panel for charging linked systems.

**Removal Sleeve • 90.340.____**
(01500, 03000, 05000, 07500)

To position the cartridge below the C-ring groove when assembling or disassembling a gas spring.

**C-Ring Removal Tool • 90.356**

To remove the C-style retaining ring safely in a single controlled motion.

**T-Handle • 90.320.2 (M8 thread)**

To remove the piston rod when disassembling and position correctly when reassembling.

**Port Servicing Tool • 90.320.8**

To perform all necessary servicing to the valve compartment.

**Portable Test Stand • 90.305.3**

Use the Portable Test Stand in conjunction with a Standard Load Cell for precise measurement of gas spring force. For more information, request bulletin #97B121.

**DADCO Pressure Analyzer • 90.315.5**

Use the DADCO Pressure Analyzer to easily charge, discharge, and gauge the pressure in DADCO's 90.9 Series Gas Springs.

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# Nitrogen Gas Spring Maintenance Instructions 90.9 Series

## Comprehensive Guide

This service manual is a simple step-by-step maintenance guide for DADCO 90.9 Series Nitrogen Gas Springs. Proper repair requires careful examination of all component parts and replacement of any that are worn or damaged. All DADCO replacement parts are available from factory stock.

***Note:*** *Nitrogen Gas Spring repair varies slightly from model to model and by mode of operation (self-contained or linked). As you proceed through the basic steps outlined in this bulletin, take care to follow the instructions pertaining to your model. All DADCO Gas Springs are permanently marked with model and serial number. Please refer to these numbers when performing repair work and when ordering replacement parts.*